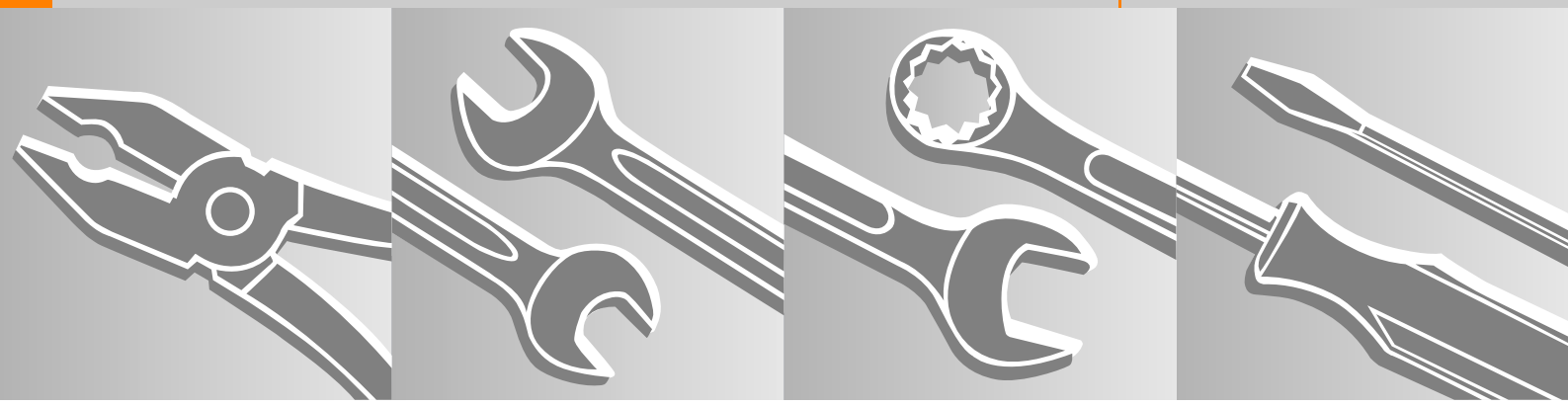
STIHL MS 441

2006-06



Contents

STIHL®

This service manual contains detailed descriptions of all the typical repair and servicing procedures for this power tool.

You should make use of the illustrated parts lists while carrying out repair work. They show the installed positions and sequence of steps for the individual components and assemblies.

Always refer to the latest edition of the relevant parts list to check the part numbers of any replacement parts.

A fault on the machine may have several causes. To help locate the fault, consult the chapter on "Troubleshooting" and the "STIHL Service Training System" for all functional groups.

Refer to the Technical Information bulletins for engineering changes which have been introduced since publication of this service manual. Technical information bulletins also supplement the parts list and service manual until an updated edition is issued.

The special tools mentioned in the descriptions are listed in the chapter "Special Tools" of this manual. Use the part numbers to identify the tools in the "STIHL Tools" manual which lists all the tools currently available from STIHL.

Symbols are included in the text and pictures for greater clarity. The meanings are as follows:

In the descriptions:

● = Action to be taken as shown in the illustration (above the text)

– = Action to be taken that is not shown in the illustration (above the text)

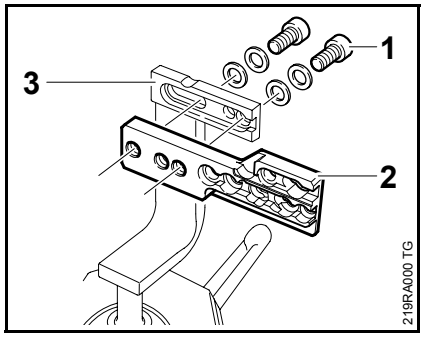
In the illustrations:

➔ Pointer (short)

➔ Direction of movement (long)

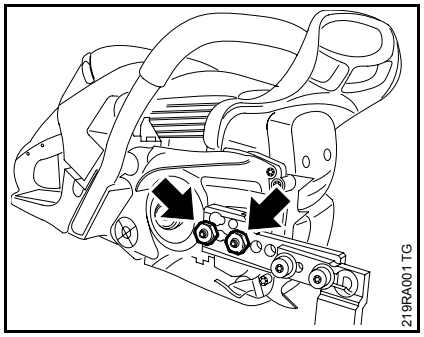
📖 4.2 = Reference to another chapter, i.e. chapter 4.2 in this example.

Service manuals and technical information bulletins are intended exclusively for the use of properly equipped repair shops. They must not be passed to third parties.



Servicing and repairs are made considerably easier by mounting the machine on assembly stand (3) 5910 890 3100. For this purpose, secure the clamping rail (2) 5910 850 1650 to the assembly stand with two screws (1) and washers.

The screws must not protrude, as they may damage the housings when clamping the machine, depending on the model.



The flange bolts on the chainsaw are guided through the outer holes in the clamping rail and secured with the nuts (arrows).

The sprocket wheel cover, bar and chain must be removed first. Pull the hand guard back against the front handle for this purpose.

Always use original STIHL replacement parts.
They can be identified by the STIHL part number, the STIHL logo and the STIHL parts symbol . This symbol may appear alone on small parts.

All local and specific national safety regulations as well as the safety precautions and warnings in the instruction manual must be observed if the machine is started up in the course of repairs or maintenance work.

Gasoline is an extremely flammable fuel and can be explosive in certain conditions.

Suitable gloves must be worn without fail if parts are heated for assembly/disassembly purposes.

Improper handling may result in burns or other serious injuries.

Do not bring any fire, flame, spark or other source of heat near the fuel. All work with fuel must be performed outdoors only. Spilled fuel must be wiped away immediately.

Test for leakages after all work on the fuel system and engine.

3. Specifications

3.1 Engine

	MS 441
Displacement:	70.7 cm^3
Bore:	50 mm
Stroke:	36 mm
Engine power to ISO 7293:	4.1 kW (5.8 HP) at 9,500 rpm
Max. permissible engine speed (with bar and chain):	13,500 rpm
Idle speed:	2,800 rpm
Clutch:	Centrifugal clutch without linings
Clutch engages at:	3,700 rpm
Crankcase leakage test	
at gauge pressure:	$p_ü$ = 0.5 bar
under vacuum:	p_u = 0.5 bar

3.2 Fuel system

Carburetor leakage test at gauge pressure:	$p_ü$ = 0.8 bar
Operation of tank vent at gauge pressure:	$p_ü$ = 0.5 bar
Fuel:	as specified in instruction manual

3.3 Ignition system

Air gap between ignition module and fan wheel:	0.15...0.35 mm
Spark plug (suppressed):	NGK BPMR 7 A
Electrode gap:	0.5 mm

3.4 Chain lubrication

Speed-controlled oil pump with reciprocating piston – manual oil flow control

Oil delivery rate:	6.0...17 cm^3/min at 10,000 rpm
Oil pump with elevated oil flow:	6.0...24 cm^3/min at 10,000 rpm

3.5 Tightening torques

DG or P screws are used in polymer and light metal components. These screws form a permanent thread when they are installed for the first time. They can be removed and installed as often as necessary without impairing the strength of the screwed assembly if the specified tightening torque is observed.
For this reason it is **essential to use a torque wrench.**

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	M 4x8	Chain tensioner cover plate/crankcase	3.0	
Screw	M 7x12.5	Fan housing shaft	12.0	
Screw	P 5x20	AV spring, crankcase/bearing plug	4.0	
Screw	M 5x20	AV spring, bearing plug/front handle	6.0	
Screw	M 5x16	AV spring, bearing plug/cylinder	10.0	2)
Screw	P 5x20	AV spring, tank housing/bearing plug	4.0	
Screw	P 4x10	Brake cable/throttle cable retainer	1.0	Q
Collar screw	M 8x21.5	Bar mounting stud	23.0	1)
Collar screw	M 6x20	Collar screw/crankcase	12.0	1)
Screw	M 4x12	Cover, chain brake/crankcase	3.0	
Screw	UNC 2.84x9	Switch/carburetor cover	0.7	VW
	M 10x1	Decompression valve	14.0	
Collar nut	M 5	Filter base/baffle/carburetor/collar screw	3.5	
Collar nut	M 5	Filter base/carburetor/collar screw	3.5	
Screw	B 4.2x9.5	Spark arresting screen/muffler	2.0	
Screw	P 4x10	Throttle cable retainer/handle housing	0.8	
Screw	M 5x16	Housing/crankcase	7.5	
Mutter	M 12x0.75	Housing/switch	2.0	W, VW
Screw	M 4x12	Generator/crankcase	3.0	1), W, VW
Screw	P 6x30	Front handle/tank housing	7.0	
Screw	M 5x35	Hand guard, left/crankcase	6.0	
Screw	M 5x20	Chain catcher/spiked bumper/ crankcase	8.0	
Screw	M 5x12	Spiked bumper/top of crankcase/ lock nut	8.0	
Screw	M 5x16	Intake elbow/cylinder	6.0	
Screw	M 5x8.8	Crankcase	6.0	
Screw	M 5x25	Crankcase	10.0	
Screw	M 4x12	Crankcase/brake band	3.0	1)
Screw	M 5x20	Fan housing/crankcase	6.0	
	M 12x1 L	Crankshaft carrier	50.0	
Nut	M 5	Muffler/flange bolt (with washer)	10.0	

Fastener	Thread size	For component	Torque Nm	Remarks
Screw	M 4x12	Oil pump/crankcase	3.5	
Screw	M 5x16	Muffler/cylinder	10.0	1)
Screw	P 4x10	Slide/housing	1.0	
Nut	M 5	Slotted nut, shroud/stud, cylinder	3.0	
Screw	P 4x10	Guard/handle housing	1.5	
Nut	M 8x1	Flywheel/crankshaft	28.0	3)
Screw	M 4x8	Side plate/crankcase	3.0	
Screw	M 5x8.5	Stud/cylinder	1.4	
Nut	M 5	Hexagon cap nut/baffle/flange bolt	1.5	
Screw	M 4x12	Pre-separator/crankcase	3.0	1)
Screw	M 5x16	Elbow connector/front handle	10.0	R
Screw	P 6x30	Elbow connector/front handle/ handle housing	7.0	R
	M 14x1.25	Spark plug	25.0	
Screw	M 5x20	Ignition module/crankcase (with washer)	8.0	
Screw	M 5x12	Spacer flange/housing	5.0	
Screw	M 6x25	Cylinder/crankcase	15.0	

Remarks:

1) Loctite 243 medium strength
2) Loctite 270 high strength
3) Connection between crankshaft and flywheel must be degreased and installed oil-free
Q = QuickStop Super chain brake
R = Wrap-around handle
V = Carburetor heating
W = Handle heating

When inserting the DG and P-type screws in an existing thread:

Insert the DG or P-type screw in the hole and turn it counterclockwise until it gently drops into the hole in axial direction.
Turn the screw in clockwise and tighten with the specified torque.

This ensures that the screw engages the existing thread and does not cut a new thread, thus preserving the strength of the screw connection.

Micro-encapsulated screws must be wetted with Loctite 243, medium strength, before being refitted.

Screwdriver speed when fitted in plastic material: max. 500 rpm for DG and P-type screws.
An impact wrench must not be used to unscrew or tighten the screw connections!

Screws with and without locking serration must not be confused!

4. Troubleshooting
4.1 Clutch

Condition	Cause	Remedy
Saw chain stops under load at full throttle	Clutch shoes badly worn	Install new clutch
	Clutch drum badly worn	Install new clutch drum
Saw chain rotates at idle speed	Engine idle speed too high	Readjust with idle speed screw **LA** (counterclockwise)
	Clutch springs stretched or fatigued	Replace the clutch springs or install new clutch
	Clutch spring hooks broken	Replace the clutch springs
Loud noises	Clutch springs stretched or fatigued	Replace all clutch springs
	Needle cage damaged	Fit new needle cage
	Clutch shoe retainer broken	Fit new retainer
	Clutch shoes and carrier worn	Install new clutch

Condition	Cause	Remedy
QuickStop Super Chain brake is not released although trigger interlock is pressed	Brake cable stretched	Adjust brake cable
	Brake cable unhooked or broken	Reattach or replace brake cable
QuickStop Super Chain brake does not brake properly – trigger interlock not pressed	Brake cable overstretched	Adjust brake cable

4.3 Chain lubrication

In the event of trouble with the chain lubrication system, check and rectify other sources of faults before disassembling the oil pump.

Condition	Cause	Remedy
Chain receives no oil	Oil tank empty	Fill up with oil, check oil pump setting if necessary
	Oil inlet hole in guide bar is blocked	Clean oil inlet hole
	Intake hose or pick-up body clogged or intake hose ruptured	Fit new intake hose and pick-up body
	Valve in oil tank blocked	Clean or replace valve
	Tooth flanks of worm worn	Replace worm
	Oil pump damaged or worn	Install new oil pump
Machine loses chain oil	Oil pump housing defective	Install new oil pump
	Oil pump damaged or worn	Install new oil pump
	Oil intake hose connection damaged	Fit new oil intake hose
Oil pump delivers insufficient oil	Oil pump worn	Install new oil pump
	Delivery rate of oil pump set too low	Adjust oil pump

Condition	Cause	Remedy
Starter rope broken	Rope pulled out too vigorously as far as stop or over edge, i.e. not vertically	Fit new starter rope
	Normal wear	Fit new starter rope
Starter rope does not rewind	Very dirty or corroded	Clean or replace rewind spring
	Spring not properly tensioned	Check rewind spring and increase tension
	Rewind spring broken	Fit new rewind spring
Starter rope cannot be pulled out far enough	Rewind spring overtensioned	Check rewind spring and reduce tension
Starter rope can be pulled out almost without resistance (crankshaft does not turn)	Guide peg on pawl or pawl itself is worn	Spring clip fatigued
	Fit new pawl	Fit new spring clip
Starter rope is difficult to pull or rewinds very slowly	Starter mechanism is very dirty	Thoroughly clean complete starter mechanism
	Lubricating oil on rewind spring becomes viscous at very low outside temperatures (spring windings stick together)	Coat rewind spring with a little standard solvent-based degreasant (not containing any chlorinated or halogenated hydrocarbons), then pull rope carefully several times until normal action is restored
	Decompression valve is not open	Open decompression valve and check, replace if necessary

4.5 Ignition system

Extreme caution must be exercised when looking for faults and when carrying out maintenance and repair work on the ignition system.
The high voltages occurring can cause serious or fatal accidents!

Condition	Cause	Remedy
Engine runs roughly, misfires, temporary loss of power	Spark plug boot is loose	Press boot firmly onto spark plug and fit new spring if necessary
	Spark plug sooted, smeared with oil	Clean the spark plug or replace if necessary
	Ignition lead is loose in ignition module	Secure ignition lead
	Fuel/oil mixing ratio – contains too much oil	Use fuel mixture with correct mixing ratio
	Incorrect air gap between ignition module and flywheel	Set correct air gap
	Flywheel cracked or has other damage or pole shoes have turned blue	Install new flywheel
	Ignition timing wrong, flywheel out of adjustment, key in flywheel has sheared off	Install new flywheel
	Weak magnetization in flywheel – pole shoes have turned blue	Install new flywheel
	Irregular spark	Check operation of switches/ contact springs and ignition module. Faulty insulation or break in ignition lead or short circuit wire. Check ignition lead/ignition module and replace if necessary. Check operation of spark plug, clean spark plug and replace if necessary.
	Crankcase damaged (cracks)	Replace crankcase

Condition	Cause	Remedy
No spark	Spark plug faulty	Install new spark plug
	Faulty insulation or short-circuit in short circuit wire	Check short circuit wire for short-circuiting to earth
	Break in ignition lead or insulation damaged	Check ignition lead, replace if necessary
	Ignition module faulty	Install new ignition module

Condition	Cause	Remedy
Carburetor floods; engine stalls	Inlet needle not sealing – Impurities in valve seat or cone	Remove and clean inlet needle or clean carburetor
	Inlet control lever sticking on spindle	Restore easy movement of inlet control lever
	Helical spring not located on nipple of inlet control lever	Remove inlet control lever and refit it correctly
	Perforated disc on diaphragm is deformed and presses constantly against the inlet control lever	Fit a new metering diaphragm
Poor acceleration	Setting of low speed screw "too lean"	Check basic carburetor setting, correct if necessary
	Setting of high speed screw "too lean"	Check basic carburetor setting, correct if necessary
	Inlet needle sticking in valve seat	Remove, clean and refit inlet needle
	Leak in diaphragm seal	Fit a new diaphragm seal
	Metering diaphragm damaged or shrunk	Fit a new metering diaphragm
	Impulse hose damaged or kinked	Fit a new impulse hose

Condition	Cause	Remedy
Engine will not idle, idle speed too high	Throttle shutter opened too wide by idle speed screw **LA**	Correct setting of idle speed screw **LA**
	Oil seals / crankcase leaking	Seal or replace oil seals / crankcase
	Air flap dirty – air flap does not close	Clean air flap, install new carburetor if necessary
	Air flap stiff	Check carburetor, replace if necessary
	Throttle cable stiff – throttle shutter does not close	Fit new throttle cable
Engine stalls at idle speed	Idle jet bores or ports blocked	Clean the carburetor
	Idle jet too rich or too lean	Set low speed screw **L** correctly
	Setting of the idle speed screw incorrect – throttle shutter completely closed	Set idle speed screw **LA** correctly

Condition	Cause	Remedy
Engine speed drops quickly under load – low power	Air filter dirty	Clean air filter, replace if necessary
	Throttle shutter does not open fully	Check throttle cable and rod
	Tank vent faulty	Fit new tank vent
	Fuel pick-up body dirty	Install a new pick-up body
	Fuel strainer dirty	Clean fuel strainer in carburetor, replace if necessary
	Leak in fuel line from tank to fuel pump	Seal connections, replace line if necessary
	Setting of high speed screw **H** too rich	Check basic carburetor setting, adjust if necessary
	Main jet bores or ports blocked	Clean carburetor
	Pump diaphragm damaged or fatigued	Fit a new pump diaphragm
	Impulse hose damaged or kinked	Fit a new impulse hose
Engine runs extremely richly, no power and very low final speed	Air flap does not open	Check carburetor; install a new carburetor if necessary
Engine too rich, loss of power and final speed too low	Air flap does not open fully at full throttle	Check carburetor; install a new carburetor if necessary
Erratic idling, too lean	Air flap does not close completely	Check carburetor; install a new carburetor if necessary

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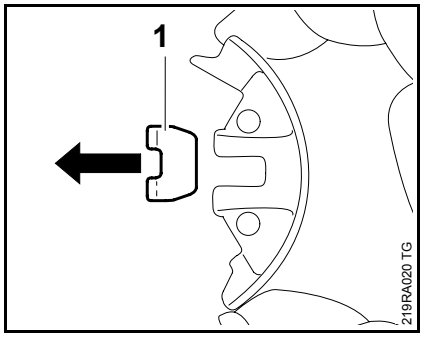
4.7 Engine

Always check and, if necessary, repair the following parts before looking for faults on the engine:

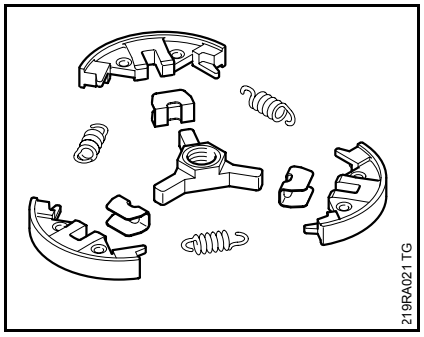
– Air filter,
– Fuel supply,
– Carburetor,
– Ignition system

Condition	Cause	Remedy
Engine does not start easily, stalls at idle speed, but operates normally at full throttle	Oil seals in crankcase damaged	Replace the oil seals
	Crankcase leaking or damaged (cracks)	Seal or replace the crankcase
Engine does not deliver full power or runs erratically	Piston rings worn or broken	Fit new piston rings
	Muffler/spark arresting screen carbonized	Clean the muffler (inlet and exhaust), replace spark arresting screen, replace muffler if necessary
	Air filter dirty	Replace air filter
	Fuel line/impulse line severely kinked or damaged	Fit new hoses or position them without kinks
	Decompression valve not closed	Close decompression valve, check and replace if necessary
	Air flap does not open	Check carburetor; install a new carburetor if necessary
Engine overheating	Insufficient cylinder cooling. Air inlets in fan housing blocked or cooling fins on cylinder very dirty	Thoroughly clean all cooling air openings and cooling fins



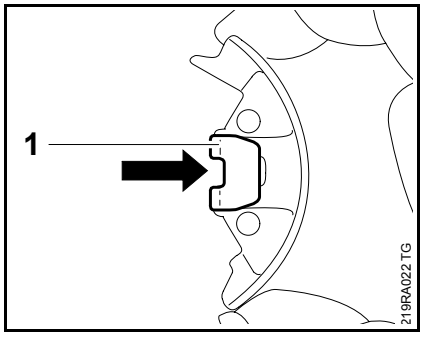
– Pull clutch shoes off the carrier.

● Pull retainers (1) off the clutch shoes.

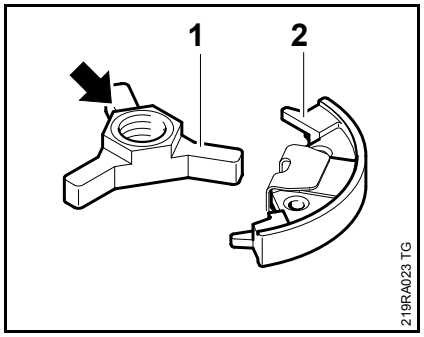


– Clean all parts.

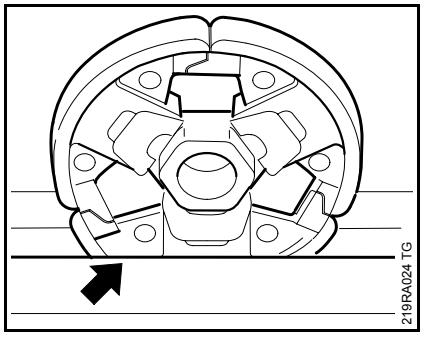
– Replace any damaged parts.



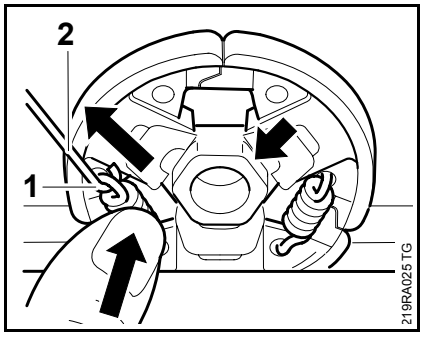
● Slip retainers (1) onto the clutch shoes.



● Fit clutch shoes (2) over the arms (1).



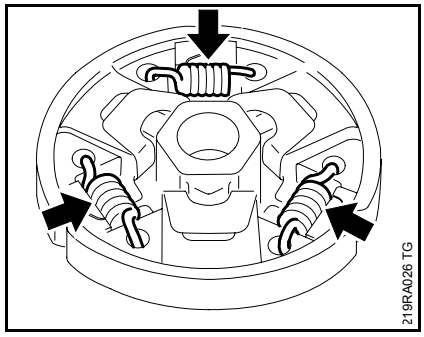
● Clamp the clutch in a vice (arrow).



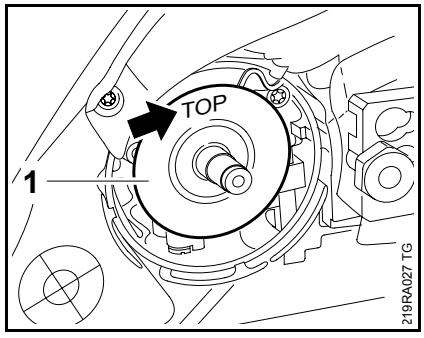
Attach the springs to the side with the raised hexagon (arrow).

● Attach one end of each spring (1) to the clutch shoes.

● Use hook (2) 5910 890 2800 to attach the other end of the spring and press it firmly into the clutch shoe.



● Check the clutch: all springs (arrows) must be attached completely.



– Washer (1) must be fitted.

It has been fitted correctly when "TOP" (arrow) faces outwards.